

Appendix A

Major Waste Streams Containing Fuel and Miscellaneous Actinides as Reported in the Historical Data Task and the Recent and Projected Data Task

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Appendix A

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A-1. YEARLY SHIPMENTS OF FUEL AND OTHER FISSILE-BASED MATERIAL AS REPORTED IN THE HISTORICAL DATA TASK AND RECENT AND PROJECTED DATA TASK

The following tables include data from Forms 110^a and ANL-W forms for remote-handled waste for the Historical Data Task (HDT) and Recent and Projected Data Task (RPDT) periods of SDA operations (i.e., 1952 through 1983 and 1984 through 1993, respectively) (LMITCO 1995a, 1995b). For some years in this period, tables are not supplied because no shipments were found for the waste streams under investigation.

A-1.1 Disposals During Historical Data Task Period

Disposals of fuel-bearing actinide waste streams sent to the SDA during the HDT period are shown by year in Tables A-1 to A-24. These streams varied from no irradiation to heavily irradiated materials. Generally, high-activity fuel-bearing shipments corresponded with high irradiation histories (some unirradiated material may be collocated with other fission-based waste).

Although many of the individual shipments in the tables show relatively small amounts of contaminants, cumulative amounts from such shipments are significant. These disposals show no clear correlation between actinide weight and activity. Many of the low-actinide weight, low-activity shipments are possibly associated with ANL-W reactor facilities other than EBR-II. The highest-activity shipments were clustered around the period in the 1960s when the fuel reprocessing campaign at EBR-II was in progress. However, many low-actinide weight shipments had disproportionately high gamma fields. The high-gamma field waste was transported in shielded containers and buried in trenches during the 1960s and early 1970s. Beginning in 1977, waste having irradiated fissile material was buried in soil vaults at the SDA. In some cases, the irradiated material was mixed with irradiated subassembly hardware. The shipments in Tables A-1 through A-24 are thought to represent the major waste streams having quantities of irradiated or unirradiated fuel-bearing fissile materials. However, it is possible that irradiated actinides were not explicitly reported in shipments and cumulatively can thus account for a significant fraction of the total irradiated waste sent to the SDA during this period. The disposals in Tables A-1 through A-25 indicate that many of the shipments having high-activity actinides reported no TRU contaminants. It is clear, however, that such contaminants were in these disposals and that cumulative disposals of such material could generate significant TRU inventories.

a. Radioactive U.S. Department of Energy Idaho Operations Office Form 110, "Idaho Operations Office Waste Disposal Request and Authorization."

A-1.2 Disposals of Fuel-bearing Waste during the Recent and Projected Data Task

Records documented in the RPDT show a dramatic reduction in the number of waste disposals that were made of irradiated fissile or fertile material by-products after 1983 (e.g., Table A-25 only shows nine shipments for 1985 through 1988). The pit disposal records for individual shipments in the RPDT Radioactive Waste Management Information System showed the presence of only trace amounts of TRU contaminants. Only a few records of remote-handled waste buried in the soil vaults showed evidence of significant amounts of irradiated material being sent to the SDA.

Table A-1. Disposals of fuel-bearing waste during 1960.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net ^b (g)	Description	Shipment Activity (Ci)
3/10/60	5.0E-03	5.0E-03	—	1.0E-02	Plutonium- and uranium-plated foils	3.0E-04
Total	5.0E-03	5.0E-03	—	<u>1.0E-02</u>	—	3.0E-04

Table A-2. Disposals of fuel-bearing waste during 1961.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net ^b (g)	Description	Shipment Activity (Ci)
10/25/61	—	—	—	4.8E+01	U/Al thermocouple plates from the Boiling Water Reactor Test Experiment.	1.0E-01
11/9/61	—	—	—	1.2E+01	Uranium solution rock-hard putty.	1.0E-03
Total	—	—	—	<u>6.0E+01</u>	—	1.0E-01

Table A-3. Disposals of fuel-bearing waste during 1962.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net ^b (g)	Description	Shipment Activity (Ci)
4/11/62	—	8.0E-02	—	8.3E-01	From EBR-II	6.5E+00
Total	—	8.0E-02	—	<u>8.3E-01</u>	—	6.5E+00

EBR-II = Experimental Breeder Reactor-II

b. In some cases, the term “Net” indicates a total inventory; however, in other cases it may indicate the balance of other TRU isotopes that were not individually reported. For example, for the disposal made on 10/25/61, the “Net” inventory of 4.8E+01 g indicates TRU isotopes that are probably present but were not individually reported. For 3/10/60, the “Net” inventory is clearly the sum of the separately reported Pu-239 and U-235 masses.

Table A-4. Disposals of fuel-bearing waste during 1963.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted Uranium (g)	Net (g)	Description	Shipment Activity (Ci)
02/27/63	1.2E-04	6.9E-01	2.7E+01	7.6E-01	2.9E+01	Uranium solution absorbed in vermiculite and packed in insulating cement: Pu-239 = 120E-04 g, U-235 = 0.69 g, normal uranium = 26.5 g, depleted uranium = 0.76 g	1.0E-03
04/12/63	—	—	1.3E+02		1.3E+02	95% uranium and 5% fissium pins, rags, paper, metal, and contaminated laboratory equipment natural uranium	1.0E-03
05/22/63	—	5.0E-01	—	—	2.5E+00	Uranium solution absorbed in insulated cement drums	1.0E-03
10/8/63	—	4.4E-01	—	—	4.9E+00	Rags, plastic, lumber, cardboard, metals	1.4E-03
12/6/63	—	2.5E+00	—	—	4.8E+00	Rags, plastic, and paper. Uranium absorbed in vermiculite in plastic bottles	1.0E-03
Total	1.2E-04	4.1E+00	1.5E+02	7.6E-01	1.7E+02	—	5.4E-03

Table A-5. Disposals of fuel-bearing waste during 1964.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted Uranium (g)	Net (g)	Description	Shipment Activity (Ci)
4/24/64	—	1.0E+00	—	—	1.1E+00	93% enriched uranium foils.	1.0E-03
5/19/64	2.4E+03	—	—	—	3.3E+01	EBR-I fuel rods, NaK bonded, encased in Zircaloy-II	2.5E+02
6/26/64	3.0E-03	2.5E-03	—	—	—	Waste from foil plating operations absorbed in vermiculite in five poly bottles and 20 defective foils in fiberboard drums	1.0E-03
6/26/64	—	2.2E+01	—	—	2.5E+01	Uranium solution absorbed in insulated cement in drums	1.0E-03
6/26/64	—	6.3E+00	—	—	1.4E+01	Uranium solution absorbed in vermiculite in drums	1.0E-03
6/26/64	—	—	—	1.7E+01	1.7E+01	Du-7 slag deposited on two zirconium crucibles in two 7C7 waste cans in drums	1.0E-03
6/26/64	—	6.3E+00	—	—	1.4E+01	Poly bottles with solution absorbed in vermiculite in drums	1.0E-03
6/26/64	—	2.0E+00	—	—	1.7E+01	Irradiated foils dissolved into solution form for chemical analysis and absorbed in vermiculite to be disposed of as DAW	1.0E-03
10/27/64	—	—	—	1.6E+02	1.6E+02	155 g depleted uranium	1.0E-03
11/5/64	—	1.0E+00	—	—	2.3E+00	Uranium/5% fissium (1.00 g U-235) dissolved for chemical analysis absorbed in vermiculite	3.0E+00

Table A-5. (continued).

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted Uranium (g)	Net (g)	Description	Shipment Activity (Ci)
11/19/64	—	—	—	—	—	Irradiated solution absorbed in vermiculite in polyethylene bottles, rags, plastic, and glass	1.3E+02
12/7/64	—	1.1E+01	—	—	2.4E+01	Uranium/5% fissium dissolved for chemical analysis and absorbed in vermiculite (11.16 g U-235) disposed of as DAW	2.0E+01
12/16/64	—	2.5E+00	—	—	6.0E+00	Uranium/5% fissium dissolved for chemical analysis and absorbed in insulating cement to be disposed of as DAW	6.0E+00
12/29/64	—	5.9E+00	—	—	1.3E+01	Miscellaneous waste including plastic, rags, paper, glass, and small amounts of radioactive liquid packed in vermiculite	5.0E-01
Total	2.4E+03	5.8E+01	—	1.7E+02	2.7E+03	—	2.7E+02

DAW = dry active waste

Table A-6. Disposals of fuel-bearing waste during 1965.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
3/16/65	—	—	—	1.5E-01	Three depleted uranium foils irradiated in Advanced Fast Source Reactor dissolved in solution form	1.0E-03
6/18/65	—	1.4E+00	—	5.5E+00	Rags, paper, metal, uranium alloy, vermiculite tests	2.0E+00
7/27/65	—	—	—	7.9E+00	EBR-II uranium fission products	2.0E+02
9/10/65	2.7E+00	—	—	2.7E+00	Uranium-5% fissium dissolved for chemical analysis and absorbed in insulating cement	4.0E+01
9/16/65	—	—	—	6.6E+00	Waste from Jr. Cave plus uranium fission alloy dissolved for chemical analysis and absorbed in vermiculite	5.0E+00
9/17/65	—	—	—	2.6E+00	Uranium fissium alloy dissolved for chemical analysis absorbed in vermiculite	6.0E+01
9/20/65	—	—	—	3.2E+00	Uranium fissium alloy dissolved for chemical analysis absorbed in vermiculite	1.5E+01
Total	2.7E+00	1.4E+00	—	2.9E+01	—	3.2E+02

EBR-II = Experimental Breeder Reactor-II

Table A-7. Disposals of fuel-bearing waste during 1966.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted Uranium (g)	Net (g)	Description	Shipment Activity (Ci)
1/12/66	—	2.5E+01	—	—	5.5E+01	Uranium fission alloy dissolved for chemical analyses, condensed and absorbed in vermiculite	5.0E+02
4/19/66	—	—	—	—	1.9E+01	Uranium fissium alloy dissolved for chemical analysis	—
4/19/66	—	—	—	—	6.4E+00	Uranium fission alloy dissolved in aqua regia for chemical analyses; condensed and absorbed in vermiculite	2.5E+02
4/20/66	—	—	—	—	1.5E+01	Uranium fission alloy dissolved in aqua regia for chemical analyses, condensed and absorbed in vermiculite	2.5E+02
6/29/66	—	—	—	—	1.7E+01	(1) 1,200-lb lead pot containing uranium fission alloy dissolved for chemical analyses absorbed in vermiculite (U-235; 125 Ci)	1.3E+02
8/12/66	—	—	—	—	7.3E+00	(1) 1,200-lb lead pot containing uranium fission alloy dissolved for chemical analyses absorbed in vermiculite (U-235 isotope; 140 Ci)	1.4E+02
8/16/66	—	1.1E+01	—	—	2.1E+01	(1) 1,200-lb lead pot containing uranium fission alloy dissolved for chemical analyses absorbed in vermiculite (U-235 isotope; 140 Ci)	1.4E+02
8/18/66	—	1.4E+01	—	—	2.9E+01	Uranium fission alloy dissolved in aqua regia for chemical analyses; condensed and absorbed in vermiculite	2.5E+02
8/18/66	—	4.3E+00	—	—	9.3E+00	(1) 1,200-lb lead pot containing uranium fission products? Dissolved for chemical analyses absorbed in vermiculite. (U-235 isotope; 9 Ci.)	9.0E+00
9/7/66	—	—	—	—	—	(1) 1,200-lb lead pot containing waste products from fission product distillations absorbed on vermiculite. (Unknown isotope; 20 Ci.)	2.0E+01
10/13/66	—	—	—	1.7E+02	1.7E+02	(1) 1,200-lb lead pot containing depleted uranium dissolved for chemical analysis, condensed and absorbed in vermiculite (Depleted uranium, 170 g isotope; 10 Ci)	1.0E+01
10/13/66	—	1.6E+00	—	—	3.5E+00	(1) 1,200-lb lead pot containing uranium fission alloy dissolved for analysis condensed and absorbed in vermiculite (U-235; 15 Ci).	1.5E+01
11/11/66	—	1.7E+01	—	—	3.5E+01	Uranium fission alloy dissolved for chemical analyses. Absorbed in vermiculite	5.0E+01
11/17/66	—	7.0E+00	—	—	1.4E+01	52% uranium fissium alloy dissolved in aqua regia; condensed and absorbed in vermiculite	1.5E+02
11/22/66	—	8.1E+00	—	—	1.6E+01	Uranium fissium alloy dissolved for chemical analyses. Absorbed in vermiculite.	5.0E+01
11/23/66	—	8.3E+00	—	—	1.7E+01	Waste from Jr. Cave, uranium fission alloy dissolved and absorbed in vermiculite	1.5E+02
Total	—	9.6E+01	—	1.7E+02	4.3E+02	—	2.1E+03

Table A-8. Disposals of fuel-bearing waste during 1967.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
1/31/67	—	2.3E+01	—	4.9E+01	Uranium fission alloy dissolved for chemical analysis and absorbed in vermiculite for disposal (22.55 g U-235)	3.0E+02
1/31/67	—	3.7E+01	—	7.5E+01	Miscellaneous DAW plus uranium fission alloy dissolved in vermiculite	2.0E+02
2/1/67	—	1.1E+01	—	2.5E+01	Dissolved uranium fission alloy from chemical analysis and absorbed in vermiculite (11.30 g U-235)	3.0E+02
2/3/67	—	—	—	1.9E+01	Hydrochloric acid solution absorbed in vermiculite (18.70 g U-235)	1.5E+02
2/21/67	—	5.6E+00	—	1.1E+01	Uranium fission alloy dissolved for chemical analysis	1.0E+01
4/6/67	2.7E-01	7.8E+00	—	7.2E+01	TREAT samples dissolved for chemical analysis absorbed in vermiculite	5.0E+01
4/6/67	—	2.4E+01	—	4.8E+01	Uranium fission dissolved for chemical analyses absorbed in vermiculite	2.0E+02
4/14/67	—	3.6E+00	—	7.3E+00	Uranium fission samples dissolved and absorbed in vermiculite	1.0E+01
4/20/67	—	1.1E+01	—	1.1E+01	TREAT samples dissolved for chemical analysis absorbed in vermiculite	1.8E+01
4/20/67	—	5.7E+00	—	5.7E+01	TREAT Pin TP-1 dissolved for chemical analysis and absorbed in vermiculite	2.0E+01
4/20/67	—	3.9E+00	—	7.8E+00	TaO ₂ sample mixed with dissolved fission fuel	1.0E+02
4/20/67	—	1.3E+01	—	1.6E+02	TREAT fuel pin dissolved for chemical analysis absorbed in vermiculite	2.6E+01
5/4/67	—	2.0E+01	—	3.9E+01	Uranium fission samples dissolved and absorbed in vermiculite	1.8E+02
5/5/67	—	9.0E+00	—	1.8E+01	Uranium fission samples dissolved and absorbed in vermiculite	1.2E+02
6/1/67	—	1.5E+01	—	3.0E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	1.5E+02
6/2/67	—	7.4E+00	—	1.5E+01	Uranium fission samples dissolved for analytical work and absorbed in vermiculite	1.0E+02
6/15/67	—	7.4E+00	—	1.5E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	4.0E+02
6/28/67	—	4.8E+00	—	9.8E+00	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	1.8E+02
7/12/67	—	1.8E+01	—	2.9E+02	Waste, TREAT samples TR-5 and A6	5.0E+01
7/12/67	—	7.3E+00	—	8.9E+00	Miscellaneous DAW plus TREAT samples H679 and H681	1.5E+01
7/20/67	—	2.5E+00	—	5.1E+00	Uranium fission alloy dissolved for chemical analysis and absorbed in vermiculite	5.0E+01
7/21/67	—	3.1E+00	—	7.4E+00	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	7.0E+01
7/25/67	—	4.3E+00	—	8.7E+00	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	4.0E+01
7/26/67	—	2.2E+01	—	4.4E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	6.0E+01
7/27/67	—	7.4E+00	—	1.5E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	5.0E+01
7/28/67	—	1.4E+01	—	2.8E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	6.0E+01

Table A-8. (continued).

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
8/1/67	—	8.8E+00	—	1.8E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	1.2E+02
8/15/67	—	5.3E+00	—	1.1E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	1.0E+02
8/18/67	—	8.0E+00	—	1.6E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	1.5E+02
8/22/67	—	1.2E+01	—	2.5E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	2.4E+02
8/22/67	—	1.0E+01	—	2.1E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	8.0E+01
9/7/67	—	1.2E+01	—	2.3E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	2.0E+02
9/7/67	—	1.0E+01	—	2.1E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	2.0E+02
9/13/67	—	5.5E+00	—	1.1E+01	Uranium fission dissolved for chemical analysis and absorbed in vermiculite	5.0E+01
10/5/67	—	2.1E+01	—	4.1E+01	Uranium fissium alloy dissolved for chemical analysis and absorbed on vermiculite (21.1 g U-235)	3.0E+02
10/5/67	—	8.9E+00	—	1.3E+01	Uranium fissium alloy dissolved for chemical analysis and absorbed in vermiculite (8.9 g U-235)	1.5E+02
10/12/67	—	6.0E+01	—	6.9E+02	9.86% enriched UO ₂ pellets	1.0E-03
11/7/67	—	3.1E+00	—	7.0E+00	Uranium fissium alloy dissolved for chemical analysis and absorbed in vermiculite (3.06 g U-235)	1.0E+01
11/7/67	—	2.5E+01	—	5.1E+01	Uranium fissium alloy dissolved for chemical analysis and absorbed on vermiculite (25.2 g U-235)	2.0E+01
11/7/67	—	2.0E+01	—	4.0E+01	Uranium fissium alloy dissolved for chemical analysis and absorbed in vermiculite plus mounted met samples (19.97 g U-235)	<1.0E+00
11/20/67	—	—	—	7.3E+01	Depleted from cold line with dissolved fissium	1.0E+01
12/7/67	—	1.9E+01	—	3.7E+01	Miscellaneous cave waste plus uranium fissium alloy samples absorbed in vermiculite (18.6 g U-235).	5.0E+01
12/11/67	—	1.8E+01	—	3.6E+01	Miscellaneous waste from Jr. Cave plus 36.33 g cold line uranium fissium alloy dissolved and absorbed in vermiculite (17.8 g U-235)	1.0E+01
12/20/67	—	2.2E+01	—	4.8E+01	52% uranium fissium alloy dissolved in acid and absorbed in vermiculite (22.2 g U-235)	2.5E+02
12/20/67	—	8.2E+00	—	1.8E+01	48% uranium fissium alloy dissolved in acid and absorbed in vermiculite, plus miscellaneous DAW (8.15 g U-235)	1.0E+01
12/21/67	—	1.2E+01	—	2.4E+01	Uranium fissium alloy dissolved in acid and absorbed in vermiculite (11.8 g U-235)	2.0E+02
12/26/67	—	7.8E+00	—	1.6E+01	Uranium fissium alloy dissolved in acid and absorbed in vermiculite (7.78 g U-235)	5.0E+01
Total	2.7E-01	5.8E+02	—	2.3E+03	—	5.1E+03

DAW = dry active waste

TREAT = Transient Reactor Test Facility

Table A-9. Disposals of fuel-bearing waste during 1968.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted uranium (g)	Net (g)	Description	Shipment Activity (Ci)
1/11/68	—	—	—	2.1E+02	2.1E+02	Depleted uranium from blanket rod samples (206.7 g).	1.0E+01
1/17/68	—	3.4E+01	—	—	6.9E+01	Cold line uranium fissium alloy samples dissolved in acid and absorbed in vermiculite (34.2 g U-235)	1.0E+00
1/17/68	—	1.0E+01	—	—	2.3E+01	52% uranium fissium alloy plus miscellaneous DAW from caves (10.15 g U-235)	1.0E+00
1/17/68	—	3.0E+00	—	—	4.5E+00	70% uranium fissium alloy samples plus miscellaneous cave waste (2.98 g U-235)	1.0E+00
1/24/68	—	1.6E+01	—	—	3.1E+01	Uranium fissium alloy dissolved for chemical analysis, condensed and absorbed in vermiculite (15.6 g U-235)	3.0E+02
1/24/68	—	1.6E+00	—	—	3.2E+00	Uranium fissium alloy dissolved for chemical analysis and absorbed in vermiculite (1.55 g U-235)	1.5E+01
1/26/68	—	7.0E+00	—	—	1.4E+01	Uranium fissium alloy dissolved for chemical analysis and absorbed in vermiculite (6.95 g U-235)	6.0E+01
1/26/68	—	1.6E+01	—	—	3.2E+01	Uranium fissium alloy dissolved in aqua regia absorbed on vermiculite (15.9 g U-235)	2.0E+02
1/26/68	—	1.2E+01	—	—	2.4E+01	Uranium fissium alloy dissolved for chemical analysis and absorbed in vermiculite (11.68 g U-235)	2.0E+02
2/5/68	—	7.6E+00	—	—	1.3E+01	Uranium fissium alloy from cold line plus miscellaneous DAW from Jr. Cave (7.6 g U-235)	1.0E+01
2/8/68	—	2.2E+01	—	—	4.4E+01	Uranium fissium alloy dissolved for chemical analysis plus miscellaneous DAW (21.8 g U-235)	1.0E+01
2/8/68	—	1.5E+01	—	—	3.0E+01	Uranium fissium alloy chemical samples plus miscellaneous DAW from Jr. Cave (14.6 g U-235)	1.0E+01
2/12/68	—	1.4E+01	—	—	2.8E+01	Uranium fissium alloy dissolved in aqua regia and absorbed in vermiculite (13.8 g U-235)	2.5E+02
2/12/68	—	2.1E+01	—	—	4.3E+01	Uranium fissium alloy dissolved in aqua regia and absorbed in vermiculite (21.42 g U-235)	1.5E+02
3/1/68	—	2.4E+01	—	—	4.9E+01	(1) Uranium fissium alloy dissolved in aqua regia, and absorbed in vermiculite (24.20 g U-235)	5.0E+01
3/1/68	—	9.5E+00	—	—	1.9E+01	(1) Uranium fissium alloy dissolved in aqua regia, and absorbed in vermiculite (9.45 g U-235)	9.5E+01
3/6/68	—	6.2E+00	—	—	1.3E+01	(1) Met samples plus miscellaneous DAW from Jr. Cave operations (6.20 g U-235)	1.0E+01
3/6/68	—	2.7E+00	—	—	5.4E+00	(1) Uranium fissium alloy from cold line analysis plus miscellaneous DAW (2.68 g U-235)	1.0E+00
3/6/68	—	9.6E+00	—	—	2.1E+01	(1) Uranium fissium alloy from cold line analysis plus miscellaneous DAW from Jr. Cave (9.55 g U-235)	1.0E+00
3/11/68	—	2.2E+01	—	—	4.4E+01	(1) Uranium fissium alloy dissolved for chemical analysis; absorbed in vermiculite (21.60 g U-235)	4.0E+00
3/12/68	—	2.7E+01	—	—	5.5E+01	(1) Uranium fissium alloy dissolved for chemical analysis; absorbed in vermiculite for disposal (27.20 g U-235)	5.0E+02
4/9/68	—	6.1E+01	—	—	1.2E+02	(1) Cold line uranium fissium samples dissolved in aqua regia, absorbed in vermiculite for disposal (60.0 g U-235)	5.0E+00

Table A-9. (continued).

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted uranium (g)	Net (g)	Description	Shipment Activity (Ci)
4/9/68	—	4.0E+00	—	—	8.2E+00	(1) Mounted samples of cold line uranium fissium alloy, plus miscellaneous DAW (4.04 g U-235)	1.0E+00
5/9/68	—	8.5E+01	—	—	1.7E+02	(1) 102 cold line uranium fissium samples plus miscellaneous DAW from Jr. Cave (84.7 g U-235)	1.0E+01
5/9/68	—	1.4E+01	—	—	2.9E+01	(1) Twenty-five Aerojet samples plus miscellaneous DAW from Jr. Cave (14.3 g U-235)	1.0E+01
5/9/68	—	7.8E+00	—	—	1.8E+02	(1) UO ₂ TREAT samples plus miscellaneous DAW from Jr. Cave, TREAT B-3 (7.8 g U-235)	5.0E+00
5/9/68	—	7.7E+00	—	—	8.8E+01	(1) UO ₂ TREAT samples plus miscellaneous DAW from Jr. Cave TREAT capsule PIN 95 CEN 241 (7.73 g U-235)	5.0E+00
5/9/68	—	3.7E+01	—	—	7.5E+01	(1) 18.32 g uranium fissium carbon samples; cold line 56.48 g uranium fission analytical samples; cold line plus waste from Jr. Cave (36.9 g U-235)	1.0E+01
5/13/68	—	7.8E+00	—	—	2.0E+02	(1) UO ₂ 5% enriched; fuel Rod B-1 (7.82 g U-235)	1.0E-02
5/14/68	—	9.1E+00	—	—	1.8E+01	(1) Uranium fissium alloy combusted for carbon analysis (9.12 g U-235)	1.0E+01
5/14/68	—	1.2E+01	—	—	2.4E+01	(1) Uranium fissium alloy dissolved for chemical analysis absorbed in vermiculite (11.9 g U-235)	9.0E+01
5/14/68	—	1.5E+01	—	—	2.9E+01	(1) Uranium fissium alloy dissolved for chemical analysis absorbed in vermiculite (14.55 g U-235)	1.0E+02
5/14/68	1.5E+00	5.9E+00	—	—	8.0E+00	(1) Uranium/plutonium samples for analysis absorbed in vermiculite (1.46 g plutonium, 5.86 g U-235)	2.0E+01
5/14/68	—	3.5E+00	—	—	5.2E+00	(1) 70% uranium fissium alloy samples dissolved for chemical analysis and absorbed in vermiculite (3.48 g U-235)	1.0E+00
5/16/68	—	1.8E+01	—	—	3.6E+01	(1) Uranium fissium alloy dissolved for chemical analysis and absorbed in vermiculite (17.8 g U-235)	1.0E+02
5/16/68	—	4.5E+01	—	—	9.1E+01	(1) Uranium fissium alloy dissolved for chemical analysis absorbed in vermiculite (44.8 g U-235).	2.0E+02
6/4/68	—	6.3E+00	—	—	1.3E+01	(1) Nine cold line samples plus miscellaneous DAW from Jr. Cave (6.34 g U-235).	2.5E+01
6/5/68	—	4.1E+01	—	—	8.2E+01	(1) Eighty-three FCF uranium fissium samples dissolved, condensed, and combined, absorbed in vermiculite (40.5 g U-235).	4.0E+02
6/5/68	—	3.9E+01	—	—	7.9E+01	(1) Hot line uranium fissium samples mounted in Bakelite for metallurgical examination (18 samples [39.2 g U-235]).	4.0E+02
6/13/68	—	4.6E+01	—	—	9.4E+01	(1) Sixty-four cold-line EUF samples plus 5.65 g EUF cold line samples plus DAW from Jr. Cave (46.3 g U-235).	5.0E+01
7/12/68	—	2.2E+00	—	—	4.5E+00	(1) Hot line uranium fissium samples dissolved for chemical analysis absorbed in vermiculite (2.2 g U-235)	4.0E+01
7/12/68	—	2.3E+01	—	—	4.6E+01	(1) Hot line uranium fissium alloy dissolved for analysis, condensed and combined; absorbed in vermiculite (22.9 g U-235)	4.0E+02

Table A-9. (continued).

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted uranium (g)	Net (g)	Description	Shipment Activity (Ci)
7/12/68	—	1.4E+01	—	—	2.7E+01	(1) Eighteen cold line samples of uranium fission alloy plus miscellaneous DAW from Jr. Cave (13.6 g U-235)	1.0E+01
7/12/68	—	2.2E+01	—	—	4.4E+01	(1) Twenty-nine samples from cold line plus miscellaneous DAW from Jr. Cave (21.8 g U-235)	1.0E+01
7/23/68	—	2.6E+01	—	—	5.2E+01	(1) Thirty-two cold line EBR II fuel samples from chemical analyses plus miscellaneous DAW (25.56 g U-238)	1.0E+01
7/23/68	—	5.6E+00	—	—	1.1E+01	(1) Six Aerojet fuel samples from chemical analysis plus miscellaneous DAW from Jr. Cave (5.58 g U-235)	1.0E+01
8/8/68	—	9.2E+00	—	—	1.9E+01	(1) Two 1,200-lb stainless steel casks containing 12 Aerojet EUF samples plus miscellaneous DAW from Jr. Cave. (9.2 g of U-235; <30 total Ci)	3.0E+01
8/9/68	—	2.7E+01	—	—	5.6E+01	(1) Four 1,200-lb stainless steel casks containing 39 EUF cold line samples plus miscellaneous DAW from Jr. Cave (27.45 g of U-235; <50 total Ci)	5.0E+01
8/18/68	—	4.6E+01	—	—	9.3E+01	(1) Six lead casks containing uranium fission alloy dissolved for chemical analysis, condensed, combined and absorbed in vermiculite (46.20 g of U-235; 460 total Ci)	4.6E+02
8/19/68	—	2.3E+01	—	—	4.7E+01	(1) Three 1,200-lb stainless steel casks containing 33 EUF cold line samples plus miscellaneous DAW for Jr. Cave (23.20 g of U-235; <10 total Ci)	1.0E+01
8/19/68	—	3.2E+01	—	—	6.4E+01	(1) Unknown number of 1,200-lb stainless steel casks containing EBR-II pin plus miscellaneous DAW from Jr. Cave (31.88 g of U-235; <10 total Ci)	1.0E+01
8/19/68	—	7.2E+00	—	—	1.9E+02	(1) Unknown number of 1,200-lb stainless steel casks containing Au-7 pellets plus miscellaneous DAW from Jr. Cave (7.20 g of U-235; <10 total Ci)	1.0E+01
8/19/68	—	1.0E+01	—	—	8.8E+01	(1) Unknown number of 1,200-lb stainless steel casks containing UO ₂ pellets plus gold absorbed in vermiculite plus miscellaneous DAW from Jr. Cave (10.08 g of U-235; <10 total Ci)	1.0E+01
8/29/68	—	2.9E+01	—	—	6.0E+01	(1) Three 1,200-lb stainless steel casks containing uranium fission alloy dissolved for chemical analysis, condensed and absorbed in vermiculite (29.40 g of U-235; 2.5 total Ci)	2.5E+02
8/29/68	—	1.8E+01	—	—	3.6E+01	(1) One 1,200-lb stainless steel cask containing uranium fission alloy combusted for carbon analysis (17.55 g of U-235; 170 total Ci)	1.7E+02
9/6/68	—	3.2E+01	—	—	6.5E+01	(1) One 1,200-lb stainless steel cask containing cold line uranium fission samples from chemical analysis plus miscellaneous waste from Jr. Cave (32.20 g of U-235; <10 total Ci)	1.0E+01
9/6/68	—	7.7E+00	—	—	1.6E+01	(1) One 1,200-lb stainless steel cask containing an Aerojet uranium fission samples from chemical analysis (7.70 g of U-235; <1 total Ci)	1.0E+00

Table A-9. (continued).

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted uranium (g)	Net (g)	Description	Shipment Activity (Ci)
9/24/68	—	3.5E+01	—	—	7.0E+01	(1) Six 1,200-lb stainless steel casks containing cold line uranium fission samples plus miscellaneous DAW from Jr. Cave operations (34.50 g of U-235; <25 total Ci)	2.5E+01
9/27/68	—	4.6E+01	—	—	9.3E+01	(1) Four 1,200-lb lead casks containing hot line uranium fission samples (86 samples) dissolved, condensed, absorbed in vermiculite (46.10 g of U-235; 450 total Ci)	4.5E+02
9/27/68	—	1.0E+01	—	—	2.0E+01	(1) One lead cask containing expended uranium fission fuel samples from carbon analysis (10.10 g of U-235; 100 total Ci)	1.0E+02
10/2/68	—	2.7E+01	—	—	5.4E+01	(1) Six 1,200-lb stainless steel casks containing 31 cold line uranium fission samples plus miscellaneous DAW from Jr. Cave (26.80 g of U-235; <10 total Ci)	1.0E+01
10/4/68	—	3.1E+01	—	—	6.2E+01	(1) Three lead casks containing hot line uranium fission samples (62 samples) dissolved, condensed, absorbed in vermiculite (30.59 g of U-235; 300 total Ci)	3.0E+02
10/17/68	—	2.3E+01	—	—	4.7E+01	(1) Three lead casks containing uranium fission alloy used for analysis completed, condensed, and absorbed in vermiculite (23.20 g of U-235; 230 total Ci)	2.3E+02
10/17/68	—	9.8E+00	—	—	1.9E+01	(1) Two lead casks containing mounted uranium fission MET samples 52% EUF (9.80 g of U-235; 150 total Ci)	1.5E+02
10/17/68	—	1.0E+01	—	—	1.6E+01	(1) One lead cask containing mounted uranium fission samples from MET analysis (10.40 g of U-235; 180 total Ci)	1.8E+02
10/17/68	—	3.9E+02	—	—	7.8E+02	One injection casting furnace with uranium fissium alloy 95% uranium/5% fissium wooden box, lead lined	1.0E+04
10/22/68	—	1.5E+00	—	—	2.2E+00	(1) One lead cask containing 70% uranium fission samples combusted for carbon analysis (1.46 g of U-235; 25 total Ci)	2.5E+01
10/22/68	—	1.7E+00	—	—	3.5E+00	(1) One lead cask containing uranium fission samples expended for carbon analysis (1.74 g of U-235; 30 total Ci)	3.0E+01
10/31/68	—	1.9E+01	—	—	3.9E+01	(1) Two 1,200-lb stainless steel casks containing cold line EUF samples plus miscellaneous DAW from Jr. Cave (19.40 g of U-235; <10 total Ci)	1.0E+01
10/31/68	—	6.9E+00	—	—	1.4E+01	(1) Four 1,200-lb stainless steel casks containing nine Aerojet cold line samples plus miscellaneous DAW from Jr. Cave (6.91 g of U-235; <10 total Ci)	1.0E+01
11/7/68	—	8.7E+00	—	—	1.8E+01	(1) One stainless steel cask containing 11 Aerojet uranium fission samples from chemical analysis plus miscellaneous waste (8.65 g of U-235; <10 total Ci)	1.0E+01
11/7/68	—	6.6E+01	—	—	1.3E+02	(1) One stainless steel cask containing 82 cold line uranium fission samples plus miscellaneous waste (65.80 g of U-235; <10 total Ci)	1.0E+01

Table A-9. (continued).

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Depleted uranium (g)	Net (g)	Description	Shipment Activity (Ci)
11/7/68	—	2.7E+01	—	—	5.4E+01	(1) Three lead casks containing 57 hot line uranium fission samples dissolved for chemical analysis; combined; condensed in vermiculite (26.80 g of U-235; 75 total Ci)	7.5E+01
11/7/68	—	3.6E+00	—	—	4.1E+01	UO ₂ pellets dissolved for chemical analysis absorbed in vermiculite	1.0E+01
11/11/68	—	3.0E+01	—	—	6.5E+01	EBR-II fuel pins coated with a thick layer of epoxy inside a 2-in. pipe with end caps length of pipe 24 in.	1.0E+00
11/11/68	—	2.9E+02	—	—	5.5E+02	Nine EBR-II fuel pins melted inside of a bonding apparatus inside a 55-gal drum	1.0E+00
12/5/68	—	3.0E+01	—	—	6.1E+01	(1) One 1,200-lb stainless steel cask containing uranium fission samples dissolved for chemical analysis; absorbed in vermiculite (30.20 g of U-235; <1 total Ci)	1.0E+00
12/5/68	—	1.6E+00	—	—	3.2E+00	(1) Unknown number of containers containing Aerojet uranium fission alloy samples dissolved for chemical analysis; absorbed in vermiculite (1.57 g of U-235; <1 total Ci) ^a .	1.0E+00
12/5/68	—	1.3E+01	—	—	2.7E+01	(1) One 1,200-lb stainless steel cask containing uranium fission alloy dissolved for chemical analysis; absorbed in vermiculite plus miscellaneous waste from caves (13.30 g of U-235; <10 total Ci)	1.0E+01
12/9/68	—	5.4E+01	—	—	1.1E+02	(1) Three 1,200-lb stainless steel casks containing uranium fission alloy samples dissolved for chemical analysis; condensed, combined, absorbed in vermiculite (54.40 g of U-235; 500 total Ci)	5.0E+02
12/9/68	—	5.2E+00	—	—	1.1E+01	(1) One 1,200-lb stainless steel casks containing uranium fission samples combined for chemical analysis (5.22 g of U-235; 50 total Ci)	5.0E+01
12/17/68	—	1.1E+01	—	—	2.1E+01	(1) Two 1,200-lb stainless steel casks containing cold line uranium fission samples dissolved for chemical analysis; absorbed in vermiculite (10.50 g of U-235; <10 total Ci)	1.0E+01
12/17/68	—	2.4E+01	—	—	4.6E+01	(1) Four 1,200-lb stainless steel casks containing Aerojet uranium fission samples dissolved for chemical analysis absorbed in vermiculite (23.92 g of U-235; <10 total Ci)	1.0E+01
Total	1.5E+00	2.2E+03	—	2.1E+02	5.4E+03	—	1.7E+04

a. Combined with cold line, noted under volume, weight, and container type.

EBR-II = Experimental Breeder Reactor-II

EUF = enriched uranium fissium

FCF = Fuel Cycle Facility

MET = metallographic fuel samples

TREAT = Transient Reactor Test Facility

Table A-10. Disposals of fuel-bearing waste during 1969.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
1/6/69	—	2.2E+01	—	4.5E+01	(1) Four stainless steel casks containing 28 cold line EUF samples plus miscellaneous DAW from Jr. Cave operations (22.26 g of U-235; 10 total Ci)	1.0E+01
1/6/69	—	2.7E+00	—	5.5E+00	(1) Two stainless steel casks containing two Aerojet uranium fission samples plus miscellaneous DAW from Jr. Cave operations (2.72 g of U-235; 5 total Ci)	5.0E+00
1/13/69	—	1.1E+01	—	2.3E+01	(1) A lead cask containing uranium fission alloy samples analyzed for carbon placed in vermiculite (11.31 g of U-235; 90 total Ci)	9.0E+01
1/13/69	—	6.0E+01	—	1.2E+02	(1) Five lead casks containing uranium fission alloy samples absorbed in vermiculite (59.97 g of U-235; 400 total Ci)	4.0E+02
2/11/69	—	1.0E+01	—	2.1E+01	Miscellaneous DAW plus 13 cold line samples	1.0E+01
2/18/69	—	—	—	1.0E+02	Miscellaneous DAW plus 63 EUF cold line samples	1.0E+01
2/19/69	—	—	—	1.0E+02	(1) Five stainless steel casks containing miscellaneous DAW from Jr. Cave plus 63 EUF cold line samples (99.89 g of uranium fission alloy; <10 total Ci)	1.0E+01
2/26/69	—	4.0E+01	—	8.1E+01	Seventy-seven uranium samples polyethylene bottles. Solid, radioactive, 400 Ci	4.0E+02
2/26/69	—	9.6E+00	—	1.1E+01	Solution from EBR-I, Mark-III fuel. Solid, radioactive, 10 Ci	1.0E+01
2/26/69	—	5.5E+00	—	1.1E+01	Uranium alloy samples. Solid, radioactive, 50 Ci	5.0E+01
3/17/69	—	2.6E+02	—	5.5E+02	Broken Vycor glass molds contained in 320-qt cans	1.0E+01
4/9/69	—	1.7E+01	—	3.4E+01	(1) Two stainless steel casks containing 19 cold line EUF samples plus miscellaneous DAW from Jr. Cave (16.90 g of U-235; <10 total Ci)	1.0E+01
4/9/69	—	—	—	—	(1) Two stainless steel casks containing depleted uranium samples absorbed in vermiculite plus miscellaneous active waste from caves (unknown isotope; <10 total Ci)	1.0E+01
4/11/69	—	2.8E+01	—	5.7E+01	FCF and EUF samples. Solid, radioactive, 200 Ci	2.0E+02
4/11/69	—	2.5E+01	—	5.1E+01	FCF and EUF samples. Solid, radioactive, 200 Ci	2.0E+02
4/16/69	—	1.5E+01	—	2.3E+01	Cold line EUF samples, miscellaneous DAW. Solid, radioactive. <10 Ci	1.0E+01
4/30/69	—	2.1E+01	—	5.8E+02	UO ₂ pellets plus waste from caves	1.0E+01
4/30/69	—	3.1E+01	—	4.6E+02	TREAT experimental waste plus miscellaneous waste from Jr. Cave	1.0E+01
5/6/69	—	1.2E+01	—	1.7E+01	12 to 64% cold line samples, miscellaneous waste from Jr. Cave. Solid, radioactive. <5 Ci	5.0E+00
5/10/69	—	3.8E+00	—	7.7E+00	52% cold line samples. Solid, radioactive. <1 Ci	1.0E+00
5/15/69	—	1.3E+01	—	1.5E+01	93% uranium alloy for chemical analysis, miscellaneous waste from Jr. Cave	1.0E+02
5/15/69	—	1.4E+00	—	2.1E+00	70% uranium fission samples for chemical analysis, miscellaneous waste from Jr. Cave. Solid, radioactive. <10 Ci	1.0E+01
5/15/69	—	1.4E+00	—	2.8E+00	3 to 52% uranium fissium alloy, miscellaneous waste from Jr. Cave. Solid, radioactive. <10 Ci	1.0E+01
5/28/69	—	2.5E+00	—	4.1E+00	64% uranium fissium samples for chemical analysis, miscellaneous DAW from Jr. Cave. Solid, radioactive. <1 Ci	1.0E+00
5/28/69	—	5.5E+00	—	9.1E+00	6 to 64% EUF samples, miscellaneous waste from Jr. Cave. Solid, radioactive. <10 Ci	1.0E+01
6/18/69	—	—	—	5.1E+02	Depleted uranium in skull and slag contained in 2-qt cans inside fiber drum	1.0E-03
7/10/69	—	9.0E-02	—	1.5E+00	(1) 6% EUF samples plus miscellaneous DAW (0.09 g U-235)	1.0E+00

Table A-10. (continued).

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
7/10/69	—	6.7E-01	—	1.4E+00	(1) Four fissium alloy samples absorbed in vermiculite plus DAW (0.67 g U-235).	5.0E-01
7/10/69	—	2.9E+01	—	4.8E+01	(1) 64% EUF samples dissolved and absorbed in vermiculite (29.17 g U-235)	1.0E+00
7/10/69	—	3.9E+00	—	7.8E+00	(1) Uranium fissium alloy absorbed in vermiculite plus DAW (3.86 g U-235)	5.0E+00
7/10/69	—	8.0E+00	—	1.8E+02	UO ₂ pellets dissolved and absorbed in vermiculite	1.0E+01
7/10/69	—	7.8E+00	—	1.1E+02	(1) Two tubes UO ₂ dissolved miscellaneous DAW (7.75 g U-235)	1.0E+00
7/23/69	—	1.8E+01	—	3.6E+01	(1) 52% uranium fissium alloy dissolved for chemical analysis absorbed in vermiculite (17.67 g U-235)	1.5E+02
7/23/69	—	5.3E+00	—	6.0E+00	93% uranium alloy for chemical analysis, dissolved in vermiculite	5.0E+01
7/24/69	—	7.1E+00	—	1.6E+01	48% EUF cold line samples plus DAW	5.0E+00
7/24/69	—	2.5E+01	—	5.1E+01	(1) 52% EUF cold line samples dissolved for chemical analysis absorbed in vermiculite (25.42 g U-235)	1.0E+00
8/1/69	—	2.6E+01	—	5.2E+01	(1) Miscellaneous DAW from Jr. Cave plus miscellaneous fuel scraps (25.93 g U-235)	5.0E+02
8/14/69	—	1.4E+01	—	2.7E+01	(1) 20 to 52% cold line EUF samples plus miscellaneous DAW from Jr. Cave (13.57 g U-235)	1.0E+01
8/28/69	—	1.3E+00	—	2.9E+00	(1) 1 to 48% EUF cold line samples plus miscellaneous DAW from Jr. Cave (1.00 g U-235)	1.0E+01
8/28/69	—	3.5E+01	—	7.0E+01	(1) 38 to 52% EUF cold line samples plus miscellaneous DAW from Jr. Cave (34.64 g U-235)	1.0E+01
9/15/69	—	1.2E+01	—	3.1E+00	Depleted uranium uranium/zirconium rod 1.5 × 8 in. long	1.0E-03
9/25/69	—	4.0E+01	—	8.2E+01	(1) Uranium fissium alloy dissolved for chemical analysis absorbed in vermiculite (40.28 g U-235)	8.0E+02
9/25/69	—	1.0E+00	—	1.5E+00	(1) 2 to 70% uranium fissium alloy samples dissolved for chemical analysis absorbed in vermiculite (82 samples) (1 g U-235)	1.5E+01
9/25/69	—	2.4E+00	—	4.9E+00	(1) 4 to 52% uranium fissium samples dissolved for chemical analysis absorbed in vermiculite (2.44 g U-235)	1.0E+00
9/25/69	—	6.7E+00	—	1.3E+01	(1) 8 to 52% uranium fissium alloy samples dissolved for chemical analysis absorbed in vermiculite (6.65 g U-235)	1.0E+01
10/10/69	—	8.0E+00	—	1.8E+02	(1) MDF-8 UO ₂ pellets plus DAW from Jr. Cave (8.00 g U-235)	1.0E+01
10/16/69	—	8.0E+00	—	1.6E+01	(1) 52% EUF samples plus miscellaneous DAW from Jr. Cave (8.02 g U-235)	1.0E+01
10/16/69	—	1.9E+01	—	3.8E+01	(1) 21 to 52% cold line samples plus miscellaneous DAW from Jr. Cave (18.56 g U-235)	1.0E+01
10/23/69	—	3.0E+01	—	6.0E+01	(1) 22 to 52% EUF cold line samples plus DAW from Jr. Cave (29.75 g U-235)	1.0E+01
10/23/69	—	5.3E+00	—	1.1E+01	6 to 52% Aerojet samples plus miscellaneous waste from Jr. Cave	1.0E+01
10/28/69	—	1.6E+00	—	6.7E+00	(1) 3 to 25% U-Injet samples plus miscellaneous active waste from Jr. Cave (1.59 g U-235)	1.0E+01
11/14/69	—	1.4E+00	—	3.0E+01	Aqua regia solution absorbed in vermiculite	1.0E-01
Total	—	9.1E+02	—	3.9E+03	—	3.2E+03

DAW = dry active waste

EUF = enriched uranium fissium

MDF = metallographic depleted fissium

TREAT = Transient Reactor Test Facility

Table A-11. Disposals of fuel-bearing waste during 1970.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
1/28/70	—	1.5E+01	—	3.0E+01	19 to 50% EUF samples for chemical analysis plus miscellaneous DAW from Jr. Cave	1.0E+01
1/28/70	—	4.4E+00	—	8.9E+00	4 to 50% EUF adjust samples plus miscellaneous DAW from Jr. Cave	1.0E+01
1/28/70	—	9.4E+00	—	5.3E-01	2 to 6% EUF samples analysis plus miscellaneous DAW from Jr. Cave	1.0E+01
1/28/70	—	1.0E+01	—	1.2E+01	3 to 93% EUF cold fire samples plus miscellaneous DAW from Jr. Cave	1.0E+01
1/28/70	—	6.4E+01	—	1.3E+02	Seventy-four EUF cold fire samples plus miscellaneous DAW from Jr. Cave	<10
2/12/70	—	8.6E-01	—	1.0E+00	Fission counter #602604 containing enriched uranium	1.0E-03
2/16/70	—	1.2E+01	—	2.4E+01	25 to 53% EUF sample for chemical analysis absorbed in vermiculite	1.0E+02
2/16/70	2.0E+00	7.0E+00	—	1.2E+01	PuO ₂ absorbed in vermiculite	2.5E-01
3/5/70	9.7E+00	3.5E+01	—	9.7E+01	Uranium plutonium absorbed in vermiculite	7.5E-01
3/27/70	—	3.2E+00	—	5.5E+01	Uranium fissium alloy pins, 6.05% enriched uranium	8.0E-03
4/24/70	—	1.6E-01	—	8.6E-01	3 to 6% EUF samples plus three DAWs from Jr. Cave operation	1.0E+01
4/24/70	—	4.2E+00	—	7.3E+01	35 to 52% EUF cold line samples plus miscellaneous DAW from Jr. Cave operations	1.0E+01
4/24/70	—	3.2E+01	—	6.5E+01	35 to 52% EUF cold line samples plus DAW	1.0E+01
5/1/70	—	1.7E+02	—	3.3E+02	Vycor glass scrap	4.9E-01
5/4/70	—	3.1E+01	—	6.3E+01	ZrO ₂ uranium fissium alloy	3.0E-01
5/22/70	—	2.3E+02	—	4.6E+02	95%/5% EBR-2 sample pin in bakelite	5.0E-01
6/2/70	—	8.1E+00	—	1.9E+02	MDF-6 plus miscellaneous DAW	1.0E+01
7/10/70	—	4.9E+01	—	1.3E+03	Uranium metal encased in cement. Paper, plastic, and rags (48.75 g U-235)	1.9E-01
8/14/70	—	8.1E+01	—	1.7E+02	Molybdenum heat shield with adhering uranium fissium alloy from cold line injection casting furnace (81.0 g U-235)	5.0E-03
9/10/70	—	5.0E-02	—	5.0E-02	Fission flux detector	5.0E+00
9/14/70	—	—	—	1.2E+02	Melt refining crucibles plutonium fissium	Unknown
Total	1.2E+01	3.7E+02	—	2.3E+03	—	1.9E+02

DAW = dry active waste

EUF = enriched uranium fissium

MDF = metallographic depleted fissium

Table A-12. Disposals of fuel-bearing waste during 1971.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Th-232 (g)	Net (g)	Description	Shipment Activity (Ci)
2/22/71	—	1.0E+03	9.4E+02	—	1.9E+03	One melt-refiner furnace base, one injection casting furnace base 52% U-235, 48% U-238	2.0E+03
2/22/71	—	4.3E+02	4.0E+02	—	8.3E+02	Vycor glass, one melt-refiner furnace base, one glass scrap dumper	8.5E+02
4/12/71	—	6.4E+01	8.5E+02	1.0E+03	1.9E+03	(1) Two melt-refining containers containing depleted uranium and natural uranium helixes, thorium ion chambers (64 g of U-235; 0.001 total Ci)	1.0E-03
12/2/71	—	1.1E+01	3.0E+01	—	4.1E+01	(1) Twelve cardboard boxes containing general plant waste (unknown weight for MFP; 30.05 g U-238, 11.2 g U-235; 0.07603 total Ci)	7.6E-02
Total	—	1.5E+03	2.2E+03	1.0E+03	4.7E+03	—	2.9E+03

MFP = mixed fission product

Table A-13. Disposals of fuel-bearing waste during 1972.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
11/7/72	—	6.4E+01	5.1E+03	5.2E+03	EUF samples, depleted uranium, scrap	1.8E-03
4/8/72	—	2.0E-03	1.1E+01	1.1E+01	MET cell scrap, general plant waste	5.1E-03
Total =	—	6.4E+01	5.1E+03	5.2E+03	—	6.9E-03

EUF = enriched uranium fissium

MET = metallographic fuel samples

Table A-14. Disposals of fuel-bearing waste during 1973.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
1/15/73	—	3.6E+01	3.0E+01	6.6E+01	Analytical waste	8.8E-05
5/7/73	—	—	7.0E+02	7.0E+02	Uranium wire foils, wire, and scrap	2.3E-04
5/7/73	—	3.0E+02	1.5E+02	4.5E+02	Fuel production scrap	7.0E-04
7/19/73	—	7.7E+01	3.6E+01	1.1E+02	Fuel production scrap	1.7E-04
10/4/73	—	2.0E+00	—	2.0E+00	Seventeen cardboard boxes containing general plant waste (1.47E-07 g MFP, 1.97 g U-235)	1.7E-05
11/13/73	1.5E-05	1.8E+02	1.5E+02	3.3E+02	Cold line crucibles, HFFC cell scrap, evaporator concentrator	5.5E-01
Total	1.5E-05	5.9E+02	1.1E+03	1.7E+03	—	5.5E-01

HFFC = Hot Fuel Examination Facility

MFP = mixed fission product

Table A-15. Disposals of fuel-bearing waste during 1974.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
4/10/74	—	7.8E+01	7.2E+01	1.5E+02	Cold line crucibles and molds	1.9E-04
6/27/74	—	5.6E+01	5.9E+00	6.2E+01	Solidified chemical solution	1.7E+02
7/15/74	—	5.9E+01	5.9E+00	6.5E+01	Solidified chemical solution	1.7E+02
7/19/74	—	1.7E+01	6.8E+00	2.4E+01	Solidified chemical solution	2.5E-02
10/4/74	—	8.7E+01	4.3E+01	1.3E+02	Grinding and polishing sludge	2.0E-04
10/30/74	—	6.8E+01	2.3E+01	9.1E+01	Solidified chemical solution	1.3E+00
Total	—	3.7E+02	1.6E+02	5.2E+02	—	3.3E+02

Table A-16. Disposals of fuel-bearing waste during 1975.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
1/6/75	—	3.7E+02	1.8E+02	5.6E+02	Cold line samples	8.6E-04
1/31/75	—	6.7E+01	3.4E+01	1.0E+02	Graphite crucibles	1.5E-04
2/25/75	—	7.5E+01	3.9E+01	1.1E+02	Grinding and polishing sludge	1.7E-04
3/4/75	—	3.6E+01	3.3E+01	6.9E+01	Uranium fissium fuel	1.4E+01
3/21/75	—	7.6E+01	4.6E+01	1.2E+02	Dissolved fuel samples	6.2E-01
5/30/75	—	7.8E+01	4.8E+01	1.3E+02	Fuel samples	8.6E+00
9/5/75	—	5.8E+02	6.6E+02	1.2E+03	Cold line EUF samples	1.5E-03
9/11/75	—	4.8E+01	4.7E+01	8.7E+01	Zirconium crucibles	1.2E-04
9/15/75	—	6.5E+00	—	6.5E+00	Chemistry samples	4.2E-01
10/30/75	—	6.3E+01	6.6E+01	1.3E+02	Grinding and polishing sludge	1.6E-04
Total	—	1.4E+03	1.2E+03	2.6E+03	—	2.4E+01

EUF = enriched uranium fissium

Table A-17. Disposals of fuel-bearing waste during 1976.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
2/16/76	—	2.3E+01	2.2E+01	4.5E+01	Cold line zirconium crucibles	5.6E-05
3/17/76	—	1.5E+01	2.5E+02	2.6E+02	Fused fuel pins, EUF natural uranium	1.2E-04
3/18/76	—	1.7E+02	5.6E+01	2.3E+02	Cold line samples	2.9E-04
3/30/76	—	1.9E+00	2.3E+01	2.5E+01	Fission chambers and Ra-226 sources	1.2E+00
5/12/76	—	7.8E+00	5.7E-01	8.3E+00	Flux wires and foils	1.7E-05
7/8/76	—	9.9E+00	9.1E+00	1.9E+01	RSWF storage liners	1.1E+00
8/2/76	—	4.9E+01	2.5E+01	7.4E+01	Irradiated EUF from EBR-II	4.2E-01
8/12/76	—	3.2E+02	3.7E+02	6.9E+02	Cold line samples and flux wires	2.2E-03
9/13/76	—	1.7E+01	2.6E+01	4.3E+01	RSWF storage liners	1.0E+00
9/14/76	—	9.7E+01	8.9E+01	1.9E+02	RSWF storage liners	6.9E-01
9/20/76	—	7.5E+01	8.3E+01	1.6E+02	RSWF storage liners	1.7E+00
9/28/76	—	7.5E+01	—	7.5E+01	Saw and grinding waste	1.6E-04
9/30/76	—	2.7E+01	2.9E+01	5.5E+01	RSWF storage liners	2.0E-01
10/5/76	—	5.0E+01	—	5.0E+01	Crucibles, molds, hardware	1.1E-04
11/17/76	—	4.2E+00	3.4E-01	4.6E+00	Fission chambers	2.0E-01
Total	—	9.4E+02	9.8E+02	<u>1.9E+03</u>	—	6.5E+00

EBR-II = Experimental Breeder Reactor-II

EUF = enriched uranium fissium

RSWF = Radioactive Scrap and Waste Facility

Table A-18. Disposals of fuel-bearing waste during 1977.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Th-232 (g)	Net (g)	Description	Shipment Activity (Ci)
1/3/77	—	4.00E+00	—	—	2.79E+00	Furnace	1.0E-06
1/17/77	—	3.66E+00	—	2.00E+02	2.04E+02	Foils and pins R-series R-11 Cal-1	1.0E-02
1/24/77	4.50E-03	—	—	—	4.50E-03	Miscellaneous	3.0E-02
2/3/77	—	3.14E+02	1.58E+02	—	4.72E+02	Crucible waste	7.2E-04
3/1/77	—	1.02E+02	—	—	1.02E+02	Dissolved fuel cold line samples	2.2E-04
4/20/77	2.70E-03	8.30E-01	5.60E-01	—	1.03E+00	Argon cell	1.5E+00
5/2/77	4.10E-03	1.03E+00	6.84E-01	—	1.72E+00	Argon cell	2.6E-01
5/26/77	2.00E-03	2.70E+00	1.33E+00	—	4.03E+00	Evaporator	5.1E+00
5/26/77	8.95E-03	—	—	—	8.95E-03	Filters	1.0E-01
7/17/77	1.50E-02	2.80E+00	1.00E+00	—	3.82E+00	Evaporator	1.3E+00
8/4/77	—	3.61E+01	1.39E+01	—	5.00E+01	Miscellaneous hardware + waste B-196 TRU	5.1E+01
8/23/77	—	1.68E+02	1.04E+02	—	2.72E+02	Fuel pins	1.0E-02
8/23/77	2.10E-02	—	—	—	2.10E-02	Miscellaneous hot cell	1.1E-01
8/26/77	6.50E-03	—	—	—	6.50E-03	Evaporator	1.5E-01
10/13/77	3.40E-03	1.00E+00	—	—	1.00E+00	Argon cell	5.0E-02
10/14/77	1.30E-03	2.00E+00	9.90E-01	—	2.99E+00	Evaporator	1.2E+01
10/28/77	2.40E-03	7.30E-01	4.80E-01	—	1.21E+00	Air cell	2.0E-01
11/4/77	2.90E-03	9.00E-01	6.00E-01	—	1.50E+00	Argon cell	1.0E-01
11/14/77	6.80E-03	2.00E+00	—	—	2.01E+00	DAW	1.0E-02
11/22/77	—	—	—	1.00E+01	1.00E+01	Thorium	1.0E-03
12/6/77	1.60E-03	5.40E-01	3.60E-01	—	9.02E-01	Argon cell	9.5E-01
Total	8.32E-02	6.41E+02	2.82E+02	2.10E+02	1.13E+03	—	7.3E+01

DAW = dry active waste

TRU = transuranic

Table A-19. Disposals of fuel-bearing waste during 1978.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
1/10/78	1.6E-03	4.8E-01	3.2E-01	8.0E-01	Argon cell	6.2E-04
1/11/78	3.0E-03	1.4E+00	6.8E-01	2.1E+00	Evaporator waste	5.0E+00
1/11/78	2.2E-03	6.6E-01	4.4E-01	1.1E+00	Argon cell	1.0E-01
1/24/78	9.7E-03	5.1E-01	9.8E-01	1.5E+00	Evaporator waste	1.5E+00
2/8/78	—	1.9E+02	1.7E+02	3.7E+02	Soil vault, miscellaneous subassembly hardware, and fuel samples	3.6E+02
2/13/78	1.4E-03	5.2E-01	7.8E-01	1.3E+00	Argon cell	6.0E+00
2/13/78	3.0E-03	6.4E-01	9.6E-01	1.6E+00	Argon cell	5.0E-01
3/8/78	1.2E-02	3.5E-01	—	3.5E-01	Argon cell	5.3E-01
5/3/78	—	—	1.0E+00	1.0E+00	TREAT waste	5.0E-02
8/10/78	—	5.6E+00	7.6E+01	8.2E+01	Flux wires	1.0E-02
8/16/78	4.1E-03	6.0E+00	9.0E+00	1.5E+01	Solidified dissolved fuel	5.0E-02
Total	3.7E-02	2.1E+02	2.6E+02	4.7E+02	—	3.7E+02

DAW = dry active waste

TREAT = Transient Reactor Test Facility

Table A-20. Disposals of fuel-bearing waste during 1979.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Th-232 (g)	Net (g)	Description	Shipment Activity (Ci)
3/14/79	—	—	1.0E+00	—	1.0E+00	Evaporator	1.3E-02
4/2/79	6.4E-02	1.8E+01	1.7E+01	—	3.5E+01	Evaporator	1.5E+00
4/5/79	—	1.0E-01	5.2E+00	3.0E+01	3.5E+01	Foils and wires	2.0E-06
4/23/79	—	1.6E+00	1.5E+00	—	3.1E+00	Solidified waste	4.1E+00
6/26/79	—	1.3E+00	—	—	1.3E+00	Fission detector	1.0E+00
6/27/79	3.1E-03	6.6E-01	3.4E-01	—	1.0E+00	General plant waste	1.0E+00
7/12/79	—	4.4E-01	—	1.4E+01	1.4E+01	Foils and wires	2.5E-06
7/13/79	—	1.0E+01	—	—	—	Samples	2.0E-03
Total	6.7E-02	3.1E+01	2.5E+01	4.4E+01	9.0E+01	—	5.1E+00

Table A-21. Disposals of fuel-bearing waste during 1980.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
4/9/80	1.0E-03	—	—	0.0E+00	Lead waste	5.0E-02
5/27/80	4.1E-03	2.9E+00	1.5E+00	4.4E+00	Evaporator waste	5.0E-01
6/9/80	1.0E-03	2.7E+00	1.1E+02	1.1E+02	Fuel samples	1.0E-04
7/24/80	1.9E-03	—	—	0.0E+00	HEPA filters	1.2E+00
8/6/80	2.0E-01	5.7E+00	3.3E+00	8.9E+00	Hardware with fuel samples	3.1E+03
9/30/80	—	3.7E+00	1.1E+02	1.1E+02	TREAT flux wires	5.8E-06
12/29/80	1.0E-03	—	—	0.0E+00	Argon cell waste	1.0E+00
Total	2.1E-01	1.5E+01	2.2E+02	2.3E+02	—	1.3E+01

HEPA = high-efficiency particulate air

TREAT = Transient Reactor Test Facility

Table A-22. Disposals of fuel-bearing waste during 1981.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	NP237 (g)	Net (g)	Description	Shipment Activity (Ci)
7/13/81	—	—	—	6.2E+00	6.2E+00	Np-237 coated stainless steel plate.	6.8E-03
1/5/81	—	2.0E+02	—	—	3.1E+02	Solid fuel cuttings from analytical chemical cannot trace to ILTSF container No B-293 from remote-handled waste records will assume sent to SDA until container is traced.	1.0E+01
12/10/81	9.8E-04	4.1E+00	2.1E+00	—	6.2E+00	Concentrator drum.	1.7E+00
Total	—	2.0E+02	2.1E+00	6.2E+00	3.2E+02	—	1.2E+01

ILTSF = Intermediate-Level Transuranic Storage Facility

SDA = Subsurface Disposal Area

Table A-23. Disposals of fuel-bearing waste during 1982.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
Total	—	—	—	0.0	—	0.0

EUF = enriched uranium fissium

Table A-24. Disposals of fuel-bearing waste during 1983.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net (g)	Description	Shipment Activity (Ci)
4/19/83	—	3.6E+01	6.0E+02	6.3E+02	Cold line samples and flux wires	9.5E-02
11/9/83	—	9.2E+01	4.6E+01	1.4E+02	Cold line samples and flux wires	2.1E-04
12/2/83	—	6.0E+01	3.0E+01	9.0E+01	EUF from cold line and O_2N_2C samples	2.1E-02
Total	—	<u>1.9E+02</u>	<u>6.7E+02</u>	<u>8.6E+02</u>	—	1.2E-01

EUF = enriched uranium fissium

Table A-25. SDA soil vault disposals of fuel-bearing waste recorded in the RPDT.

Disposal Date	Pu-239 (g)	U-235 (g)	U-238 (g)	Net Actinide (g)	Description	Shipment Activity (Ci)
1/22/85	—	2.8E+01	—	2.8E+01	Core subassembly parts + natural uranium + depleted uranium + enriched uranium	7.5E+03
6/14/85	5.0E-02	1.6E+01	—	2.4E+01	Cell waste, main	8.5E+01
11/19/85	1.0E-03	—	—	<u>3.4E+00</u>	Subassembly hardware	4.8E+03
Subtotals	5.1E-02	1.6E+01	—	2.7E+01	—	4.9E+03
2/24/86	9.5E-02	7.1E-02	—	3.5E+01	Paper, cloth, and plastic	2.0E+01
7/23/86	8.9E-02	3.6E+01	—	5.6E+01	Cell waste, miscellaneous	1.9E+02
Subtotals	1.8E-01	3.6E+01	—	9.1E+01	—	2.1E+02
2/9/87	2.7E-06	2.6E+00	—	2.7E+00	Core subassembly parts + natural uranium + depleted uranium + enriched uranium	5.0E+03
9/24/87	3.1E-06	2.6E+01	—	<u>4.7E+02</u>	Core subassembly parts + natural uranium + depleted uranium + enriched uranium	9.1E+03
Subtotals	5.8E-06	2.9E+01	—	4.7E+02	—	1.4E+04
3/1/88	1.2E-05	3.0E+01	1.6E+04	1.6E+04	Core subassembly parts and depleted uranium rods	5.5E+03
6/2/88	3.0E-03	2.4E-01	1.2E+01	1.2E+01	Combination of glass, plastic, liquid absorbent, metal chips, and wire	1.0E+01
Subtotals	3.0E-03	3.0E+01	1.6E+04	1.6E+04	—	5.5E+03

A-2. REFERENCES

LMITCO, 1995a, *A Comprehensive inventory of Radiological and Nonradiological Contaminants in Waste Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1952-1983*, INEL-95/0310, Rev. 1, Idaho National Engineering and Environmental Laboratory.

LMITCO, 1995, *A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried or Projected to Be Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1984-2003*, INEL-95/0135, Rev. 1, Idaho National Engineering and Environmental Laboratory.